II. REMARKS / ARGUMENTS

A. SUMMARY OF THE AMENDMENTS

The application now contains 43 claims numbered 1 and 3-44.

Independent claim 1 has been amended to include limitations from former dependent claim 2, which has been cancelled.

The dependency of claims 3-4, 11, 38, 40 and 42 has been amended in light of the above mentioned claim amendment.

Claims 3-4 have been further amended to clarify the subject matter being claimed.

No new subject matter has been added to the application.

B. REJECTION OF CLAIMS 1-8, 11-16, 18-21 and 31-43 UNDER 35 U.S.C §103

On page 2 of the Office Action, the Examiner has rejected claims 1-8, 11-16, 18-21 and 31-43 under 35 U.S.C. 103(a) as being unpatentable over Chang *et al.* U.S. Patent No. 6,731,631 (hereinafter referred to as Chang) in view of Oguchi U.S. Patent No. 6,907,042 (hereinafter referred to as Oguchi). In response, the applicant has amended independent claim 1 and respectfully submits that the claims are now in allowable form as set forth herein below.

Claim 1

Independent **claim 1** now reads as follows (emphasis added):

> 1. A switch fabric implemented on a chip, comprising:
> a) an array of cells;
> b) an I/O interface in communication with said array of cells for permitting exchange of data packets between said array of cells and components external to said array of cells;

c) each **cell communicating with a plurality of cells of said array** permitting exchange of data packets between the cells of said array;
d) each cell including:
   I) a memory for receiving a data packet from another cell of said array;
   II) a control entity to control **release of a data packet toward a selected destination cell** from among the plurality of other cells of said array at least in part on a basis of **a degree of occupancy of the memory in said destination cell;**
   III) a transmitter in communication with said I/O interface and in **direct** communication with **every cell from among the plurality of other cells** of said array, said transmitter operative to process a data packet received from said I/O interface to determine a destination of the data packet and forward the data packet to at least one cell from among the plurality of other cells of said array selected on a basis of the determined destination;
   IV) a plurality of receivers associated with respective cells from said array, each receiver being in direct communication with a respective cell allowing the respective cell to forward data packets to the receiver; said receivers in communication with said I/O interface for releasing data packets to said I/O interface.

The Applicant respectfully submits that the above-emphasised subject matter is neither taught nor suggested by the cited art. Specifically, the cited art does not teach or suggest "a transmitter [associated with each cell in said array] in direct communication with every cell from among the **plurality** of other cells of said array". This architecture allows the transmitter of a given cell to forward a processed data packet to a selected destination cell without having to interface with any other non-destination cells of the array.

Regarding Chang, this reference discloses a switch fabric system on a chipset. Each switch fabric component (Figure 20, element 2000) is connected to one or more interface transmitters (Figure 20, element 2006) and one or more interface receivers (Figure 20, element 2002), each of which may be connectable with an interface receiver of another switch fabric component or a port controller. Chang however, does not mention or suggest a direct connection between the transmitter/receiver interface of each switch fabric component and the receiver/transmitter interface of every one of the other switch fabric components that form a part of the system. Moreover, as seen in Figure 1, Chang's switch fabric components 104 are connected in a three-stage Clos network arrangement (see column 6, lines 16-33). Thus, the switch fabric components from one outer stage (104a, 104b, 104c, 104d) are only indirectly able to reach the switch fabric components from the other outer stage (104i, 104j, 104k, 104l) by passing through the middle stage (104e, 104f, 104g, 104h). Hence it will be appreciated that there is no direct connection, for example, between 104a and 104k, without interfacing with one of the switch fabric components of the middle layer.

Further, Chang makes use of "switching tables associated with each switch fabric component to record which devices may be reached through each port of a switch fabric component" (see column 18, lines 1-8, lines 19-35). These switching tables are used to define the path of a data packet through the various components of the switching fabric from the point of entry to destination. The use of such a table would be redundant if, as is the case with the claimed invention, every transmitter were directly connected to every one of the other cells of the switch fabric array, providing a direct path between a given transmitter and every other cell in the array of cells.

Turning now to Oguchi, this reference discloses a buffer in an upper layer protocol processor and a reassemble mechanism in a lower layer protocol processor. Both of these components are part of the same packet processing component and are connected to each other in a one-to-one manner. Thus, it is clearly not the case that a transmitter associated with each cell in an array is in direct communication with every cell from among a plurality of other cells of the array.

Notwithstanding the above, the Applicant also points out that the Examiner has conceded that Chang does not explicitly disclose "a control entity to control release of a data packet toward a selected destination cell of said array at least in part on a basis of a degree of occupancy of the memory in said destination cell". Thus, the Examiner has turned to Oguchi with the intent of showing that Oguchi teaches this limitation. Specifically, the Examiner states that "Oguchi discloses the limitation of a control entity (recited "reassembly buffer processor" as a control entity) to control the release of data packets towards a selected destination cell of said array at least in part on the basis of a degree of occupancy of the memory in said destination cell (recited "the free space notification portion allocated in the upper layer can detect the free space of the receiving buffer...)".

However, the Applicant respectfully disagrees with the Examiner's assertion and would like to point out that Oguchi does not include a switching fabric configuration with a plurality of communicating cells. In fact, the two components of Oguchi that the Examiner has referred to (i.e., the buffer in the upper layer protocol processor and the reassemble mechanism in lower layer protocol processor), are both part of the same packet processing component and are connected to each other in a one-to-one manner. Thus, it is impossible for Oguchi to teach the

scenario where a particular cell of a switching fabric is in communication with a plurality of other cells, and where a data packet is transmitted towards "a selected destination cell from among the plurality of other cells of said array", on the basis of the degree of occupancy of the destination cell.

In short, it should be apparent that the cited prior art references, whether taken alone or in combination, neither explicitly disclose nor implicitly suggest all of the limitations of independent claim 1. It follows that at least one of the criteria required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j)[1] has not been satisfied. The Examiner is therefore respectfully requested to withdraw the rejection of claim 1, which is now believed to be in condition for allowance.

Claims 3-8, 11-16, 18-21 and 31-43

Claims 3-8, 11-16, 18-21 and 31-43 are all either directly or indirectly dependent on independent claim 1 and therefore include all the limitations of independent claim 1, including the features already shown above to be absent from both Chang and Oguchi. Thus, the Examiner is respectfully requested to withdraw the rejection of dependent claims 3-8, 11-16, 18-21 and 31-43.

Claim 3

Notwithstanding the above, the Applicant traverses the Examiner's rejection of claim 3. More specifically, on page 5 of the Office Action, the Examiner interprets "...the data channel associated with said given cell connecting the transmitter of said given cell to receivers in cells other than said given cell ..." as being previously disclosed by Chang where "[the] switch matrix provides a data path for packets in the switch component. The switch matrix is coupled to both the interface receiver(s) and the interface transmitters(s)".

[1] For the Examiner to establish a *prima facie* case of obviousness, three criteria must be considered: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings, (2) there must be a reasonable expectation of success, and (3) the prior art references must teach or suggest all of the claim limitations. MPEP §§ 706.02(j), 2142 (8th ed.).

In response, the Applicant respectfully directs the Examiner's attention to the following elements of claim 3:

> 3. A switch fabric as defined in claim 1, wherein said array of cells includes a plurality of data channels, each data channel being associated with a given cell, the data channel associated with said given cell **directly** connecting the transmitter of said given cell to **receivers** in **cells** other than said given cell and associated with said given cell.

The Applicant respectfully submits that Chang does not disclose or suggest a data channel (or switch matrix) that connects "the transmitter of said given cell to receivers [*plural*] in cells [*plural*] other than said given cell...", implying a one-to-many mapping between a transmitter and other cells [*plural*] associated with the transmitter.

As such, in addition to being dependent on allowable claim 1, claim 3 further recites at least one additional limitation that is not taught by Chang. It should also be pointed out that this limitation is also absent from Oguchi. Accordingly, the Examiner is respectfully requested to withdraw the rejection of claim 3.

Claims 11-16

Notwithstanding the above, the Applicant traverses the Examiner's objection to the subject matter of claim 11. More specifically, on page 6 of the Office Action, the Examiner alleges that the "packet memory of element 302a" (see Figure 3) and "the packet memory 302b" (see Figure 3) are equivalent to the first memory (associated with the receiver) and the second memory included in the transmitter.

The Applicant respectfully disagrees with the Examiner's remarks and submits that the memory components from Figure 3 refer to memories associated with a port controller device connected to the switch fabric component (column 7, lines 27-29) and not with memory elements included the switch fabric component itself. The Applicant respectfully draws the Examiner's attention to Chang's Figure 2, which clearly shows that the port controllers and their associated memories are external to Chang's switch fabric 204. Further, column 15, lines 55-58 of Chang states that "the interface receiver has an external I/O for connection to an

interface transmitter of another switch fabric component or an interface transmitter 4014 of a port controller", clearly designating the port controller as an external I/O component.

Furthermore, the claimed invention recites cells of a switch fabric with "a [first] memory for receiving data packets from another cell" and "a second memory [included in the transmitter of a given cell] for storing packets received from said I/O interface". This is in contrast with Chang, which includes a common memory on the switch matrix for data packets input from an I/O interface and data packets that are waiting to be transmitted out of the switch matrix. Specifically, column 16, lines 2-7 of Chang states, "The switch matrix receives data (i.e. packets) from the interface receivers. Each incoming packet is stored in memory of the switch matrix until the packet can be transferred to the interface transmitter 2006 for transmission out of the switch fabric". It is therefore apparent that Chang does not disclose first and second memories of the switch fabric.

The above arguments also apply to claims 12-16 since claims 12-16 are all directly or indirectly dependent on claim 11.

As such, in addition to being dependent on allowable claim 1, claims 11-16 further recite at least one additional limitation that is not taught by Chang. It should also be pointed out that this limitation is also absent from Oguchi. Accordingly, the Examiner is respectfully requested to withdraw the rejection to dependent claims 11-16.

Claims 38-39

Notwithstanding the above, the Applicant traverses the Examiner's rejection of claims 38 and 39. Specifically, on page 11 of the Office Action, the Examiner contends that the "length" element of the data packet header disclosed by Chang is equivalent to "each word compris[ing] a field indicative of whether said word is a pre-determined number of words away from said last word of said data packet".

The Applicant respectfully disagrees with the Examiner's remarks and submits that Chang neither discloses nor suggests " ...each data packet comprising of a plurality of words ..., wherein each word comprises a field indicative of whether said word is a pre-determined

number of words away from said last word of said data packet." In contrast, Chang (see column 10, lines 55-58) shows only one field per packet ('length' 610), placed within the header of the packet, that is related to how far the packet is from its end. Chang does not show the partitioning of packets into words, and does not mention or suggest a plurality of words, each word containing a field indicative of it's own position relative to the last word of the data packet. It is therefore asserted that Chang does not disclose the subject matter of claim 38.

The above arguments also apply to claim 39 since claim 39 is directly dependent on claim 38.

As such, in addition to being dependent on allowable claim 1, claims 38-39 further recite at least one additional limitation that is not taught by Chang. It should also be pointed out that this limitation is also absent from Oguchi. Accordingly, the Examiner is respectfully requested to withdraw the rejection to dependent claims 38-39.

C. REJECTION OF CLAIMS 9-10 UNDER 35 U.S.C §103

On page 13 of the Office Action, the Examiner has rejected claims 9-10 as being unpatentable over Chang *et al.* U.S. Patent No. 6,731,631 (hereinafter referred to as Chang) in view of Oguchi U.S. Patent No. 6,907,042 (hereinafter referred to as Oguchi, and further in view of McCrosky *et al.* US Patent No. 6,741,552 (hereinafter referred to as McCrosky). In view of the amendments to claim 1, the Applicant respectfully submits that claims 9-10 are in allowable form as set forth herein below.

Specifically, it has already been demonstrated in this response that neither Chang nor Oguchi teach or suggest the features of (i) "a transmitter [associated with each cell in said array] in direct communication with every cell from among the plurality of other cells of said array" and (ii) "a control entity to control release of a data packet toward a selected destination cell of said array at least in part on a basis of a degree of occupancy of the memory in said destination cell". In addition, these features are also missing from McCrosky, which merely discloses a binary hypercube structure.

In short, it should be apparent that the cited prior art references, whether taken alone or in combination, neither explicitly disclose nor implicitly suggest all of the limitations of independent claim 1. It follows that at least one of the criteria required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j) has not been satisfied. The Examiner is therefore respectfully requested to withdraw the rejection of claims 9 and 10, which are dependent on claim 1.

D. ALLOWABLE SUBJECT MATTER

On page 14 of the Office Action, the Examiner has indicated that claims 17, 22-30 and 44 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Applicant is grateful for these remarks but respectfully declines the Examiner's offer to rewrite the claims in view of the arguments presented above in support of claims 1, 1-16, 18-21 and 31-43.

III. CONCLUSION

In light of the foregoing, the Applicant is of the view that claims 1 and 3-44 are in allowable form. Favorable reconsideration is requested. Early allowance of the application is earnestly solicited.

If the application is not considered to be in full condition for allowance, for any reason, the Applicant respectfully requests the constructive assistance and suggestions of the Examiner in drafting one or more acceptable claims pursuant to MPEP 707.07(j) or in making constructive suggestions pursuant to MPEP 706.03 so that the application can be placed in allowable condition as soon as possible and without the need for further proceedings.

Respectfully submitted,

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